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JSC Photo S97-04685 by Steve Candler

WELCOME HOME—STS-83 Pilot Susan Still receives an exuberant welcome home from her long time companion, Bozo. Bozo is 14 years old and Still has had the dog since he was six weeks old. Still and Commander Jim Halsell guided *Columbia* to a smooth landing at the Kennedy Space Center April 8, bringing the curtailed Microgravity Sciences Laboratory-1 mission to a safe conclusion. Plans to refly STS-83 are under review.

JSC leaders take strategic look ahead

By Toni Loftin

Four NASA managers met with employees early this month and outlined their thinking about how JSC will pave the way for assembly of the International Space Station and develop programs for trips to the Moon and Mars.

The third in a series of JSC Strategic Management All Hands meetings, the April 9 discussion provided insight for JSC employees into program activities planned by Space Shuttle Program Manager Tommy Holloway, EVA Project Office Manager Don McMonagle, Space Operations Director John O'Neill and Acting Mission Operations Director Randy Stone. The managers also discussed the relevancy of their activities to the Human Exploration and Development of Space Strategic Plan.

In a discussion of space shuttle upgrades, improved orbiter capability, improved safety, cost reduction and how the Space Shuttle Program fits into the HEDS Strategic Plan, Holloway outlined several orbiter upgrade goals that include an increase in flight rates and a reduction of cost-per-pound to orbit.

"We are going to continue to improve the shuttle to make it all it can be," Holloway told the audience

in Teague Auditorium. "We will upgrade the system to increase our safety and overall capability and we are looking forward to your dedication and commitment to make that happen."

Holloway also discussed the unique challenges that the International Space Station will present to both the Space Shuttle and International Space Station Programs.

"The International Space Station will provide a unique challenge to all of us," he said. "The operations challenge of the space station is something that is bigger and more exciting and provides more opportunities for some really outstanding work than we have ever done in the history of the space program before."

McMonagle zeroed in on the EVA Project Office's Advanced EVA Research and Development Group, which didn't exist before the creation of the EVA Project Office.

"This group has the responsibility to look down the road to a return to the Moon, and perhaps future missions to Mars in a couple of decades," McMonagle said. "We are talking about what research and technology developments should go on today to be able to support those

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JSC's help desk changes to improve service

JSC's Information Systems Directorate and the Information Systems Contract are taking steps to provide faster, more effective service to information technology users at JSC despite a burgeoning need for such "help desk" service.

Help desk calls have grown consistently during the past three years from 68,000 calls in 1994 to 142,000 in 1996. The increase of calls began with the deployment of Windows 95 and Office 95 and continued to increase as more and more NASA employees and contractors began

using the Internet and local Intranets. Although the number of calls to the ISD Help Desk has continued to grow this year, the situation has begun to improve with reduced average wait times.

"Today's situation is a direct consequence of accepting the challenge of reducing budgets by 40 percent over the last two years while increasing the number of people supported," said ISD Director Dick Thorson. "Although our costs relative to industry are competitive, raising the level of user satisfaction is

our main focus."

Early analysis of calls indicated that the increase was transitory. The Information Systems Contract team of Northrup Grumman, Boeing and SAIC planned a multi-phased approach to meet the demand.

The first phase moved the Help Desk and consolidated it with other direct contact customer services. The new Information Technology Operations Center consolidates many functions that allow ISC to focus customer interactions through a centralized group and respond to

commonly reported problems. From this center, problems can be remotely diagnosed and the appropriate support people can be dispatched, including those already located in other buildings on site.

"We have a lot of people here who are very excited about what's happening, wanting to do the best job we can. Once we get everything ironed out people will really see a change for the better," said Laurie Branham, a Northrup Grumman employee who has been working on

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Plans under way for larger Inspection '97

A dedicated team of employees has begun working on plans to host 5,000 professionals at JSC's Inspection scheduled in November.

During Inspection 97, JSC will invite industry, business, community and education leaders to inspect—at the working level—the technologies and facilities that are used to accomplish its science, engineering, operations and management challenges.

"Inspection 97 will introduce our guests to the technologies and facilities in use and under development here at JSC," said Chairman Doug Blanchard. "The objective is to make our technologies, developed with federal tax dollars, available for solving problems in our region and around our nation. In addition, JSC will be looking for better approaches to our own challenges. Specifically, we want to identify areas where collaborative work could be mutually

advantageous."

Organizers said that Inspection 97 success will result from working together to create new and better solutions for JSC and the community.

Watch for a call next week to submit exhibit proposals. To keep up with all the latest activities look for the Inspection web page coming soon. The committee is seeking volunteers. Employees may contact their directorate committee representative.

This year's committee includes Blanchard, Debbie Denton-Misfeldt, Doug Peterson, David Westfall, Al Manson, Gloria Demers, Melissa Bodeau, Norm Chaffee, Michelle Munk, Bob Dotts, Ginger Gibson, Cathey Lamb, Stacey Nakamura, Jeff Evans, Lois Lenox, Peggy Wooten, Dale Fessenden, Roy Melton, Tom Rathjen, Mary Chesler, Diana Norman, Stephanie Castro, Tom Smith and Lupita Armendariz.



JSC Photo S97-04908 by Hector Gongora

CHECK OUT—JSC Director George Abbey, Deputy Director Brian Duffy and Assistant Director Technical Tom Akers visit with one of the 24 teams of undergraduate college students from around the country who are preparing to "float" aboard the KC-135 with experiments they designed. The NASA Reduced Gravity Student Flight Opportunities gave students from as far off as Idaho the chance to spend two weeks at JSC in briefings and training before conducting experiments during the 25 to 40 seconds of weightlessness on the aircraft. The program is seen as a way to encourage the next generation of scientists and engineers.

Atlantis on track for sixth mission to Mir station

By Kyle Herring

Despite a delay in moving from the Orbiter Processing Facility to the Vehicle Assembly Bldg., *Atlantis* continues on course for the STS-84 launch shortly after 3 a.m. CDT May 15 to begin its sixth straight trip to the Russian Mir Space Station.

The holdup in the move to the VAB was prompted by inspections of bolt holes that have exhibited a small amount of elongation with loads during the separation of the external tank shortly after main engine cutoff. The bolts hold a protective cover called a "pyro can" in place on top of the pyrotechnic device and explosive bolt that initiates separation.

Managers elected to make a one-flight-only adjustment to provide insurance in the unlikely event that the original holes may fail. The potential problem will be resolved with a permanent fix on the other three orbiters and *Atlantis* after the May mission.

The adjustment essentially allows for the temporary installation of three additional bolts and pins to ensure the desired margin of safety.

The work was expected to begin shortly after *Atlantis* reaches the launch pad for the final weeks of preparation prior to launch. Shuttle

managers plan to meet next Wednesday in the traditional Flight Readiness Review to select the actual launch date.

The sixth docking mission's primary goal is to deliver Mike Foale to the station and return Jerry Linenger following a four-month stay. In addition to Foale and Linenger, STS-84 crew members are Commander Charlie Precourt, Pilot Eileen Collins and Mission Specialists Jean-François Clervoy, Carlos Noriega, Ed Lu and Elena Kondakova.

Meanwhile, engineers around the agency

are preparing to support a reflight of *Columbia* and its Microgravity Science Laboratory after the STS-83 mission was cut short earlier this month. Though it appears possible that the reflight will fit the schedule behind *Atlantis*, managers are continuing to evaluate the training requirements and processing flows as they relate to downstream missions. The mission was cut short earlier this month when a fuel cell exhibited an unacceptable voltage differential. Troubleshooting on the fuel cell so far has not recreated the anomaly on orbit.

Discovery continues to be prepared for its next flight to deploy and retrieve a science satellite to study Earth's atmosphere.

First use of Orlan suits

Linenger to become first American space walker outside Mir

By Karen Schmidt

Astronaut Jerry Linenger is expected to don a Russian Orlan space suit next week and venture out of the Mir Space Station, becoming the first American to conduct a space walk in a Russian suit.

He will be joined in space by Mir 23 Commander Vasily Tsibliev while Flight Engineer Alexander Lazutkin remains inside to monitor the space walkers' progress. Linenger and Tsibliev will deploy two experiments and retrieve two others. The crew also will evaluate a space station common tether and report back to American and Russian training instructors how well they were prepared for the five and a half-hour venture into the cold environment of space.

"I'm using the new Orlan M," Linenger said before his flight to the Russian station. "And it's the first time anyone's used the suit. Tsibliev and myself will be going out in basically a rebuilt, brand new sort of Russian suit. So it's going to be an interesting space walk."

This week Linenger and Tsibliev spent time checking their space suits, which arrived on a Progress resupply vehicle earlier this month. They also reviewed procedures and training material and watched a video on how to prepare the Mir's airlock. One of the two experiments to be deployed, the Optical Properties Monitor, also received a checkout prior to its deployment.

The crew will emerge from the Kvánt 2 module on the Russian outpost and Linenger will tether himself to Mir's crane. The crane is used much like the shuttle's robot arm to transfer crew members and equipment to various locations on the station. Tsibliev will operate the crane, positioning Linenger near the docking module where Linenger will attach the Optical Properties Monitor. The experiment is

designed to measure the effect of the space environment on a variety of materials ranging from telescope mirrors to spacecraft coatings.

"We have a lid that will open up and it will expose a lot of different materials...glasses, things like that, to the environment of space," Linenger said. "We'll actually get real time readings. We'll hook up some data cables and power cables, and throughout the flight we'll be able to take a look at these samples."

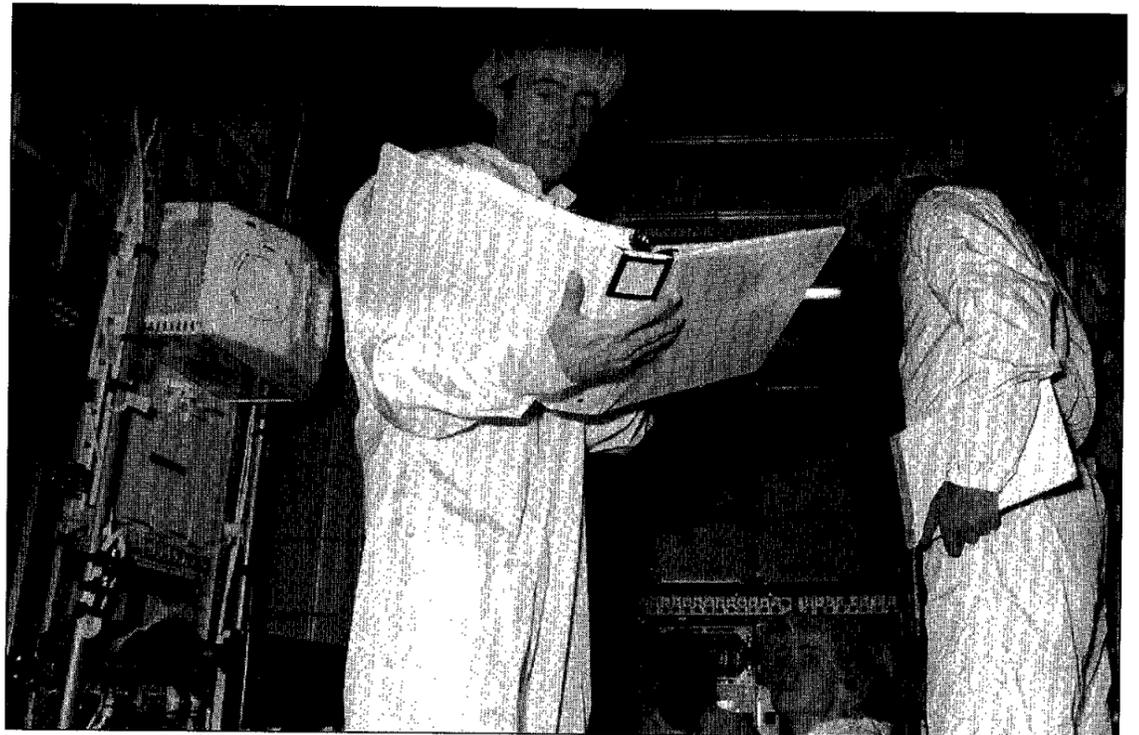
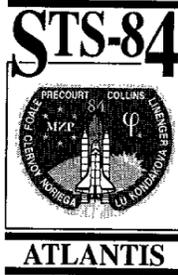
Once the experiment is up and running, Tsibliev will bring Linenger back to the Kvant-2 module, and the two space walkers will retrieve the Mir Sample Return Experiment. The MSRE was deployed by Mir 21 Cosmonauts Yuri Onufrienko and Yuri Usachev last year. The experiment

has been gathering information on cosmic dust; and scientists hope to analyze the samples for chemical, organic and isotopic composition that can lead to a better understanding of the external environment of Mir.

Once the MSRE is temporarily stowed in the airlock, Linenger and Tsibliev will deploy a radiation detection device on the Kvant-2 module.

The space walkers' final task will be to retrieve the Particle Impact Experiment. PIE also was deployed by Onufrienko and Usachev last year. Data from this experiment will give scientists more information on the mineral composition of cosmic dust. Both the MSRE and PIE experiments will return to Earth onboard *Atlantis* during STS-84.

"During dark passes I will basically have to stop working and just hang on, and view the stars, which will be a great moment," Linenger said. "I will definitely feel alone out there in the dark by myself. It's going to be an interesting time out there...out in the deep space by myself."



INTERNATIONAL CREW—STS-84 crew members traveled to Kennedy Space Center last month to participate in the crew equipment integration test inside the Spacehab double module. From left are Mission Specialists Jean-François Clervoy of the European Space Agency, Edward Tsang Lu and Elena Kondakova of the Russian Space Agency. The three astronauts will fly aboard *Atlantis* with Commander Charlie Precourt, Pilot Eileen Collins and Mission Specialists Carlos Noriega and Mike Foale to pick up American Jerry Linenger at the Russian Mir Space Station. Foale will replace Linenger for a four-month stay on the Russian outpost.

NASA Photo KSC-97PC-500



NASA revises station launch schedule

NASA managers consider options to shuttle manifest

By James Hartsfield

NASA will begin its on-orbit assembly of the International Space Station no later than October 1998, and is looking at options that will allow the agency to work around the delay caused by the late arrival of a key station module.

"We knew from the outset that building an International Space Station was going to be tremendously challenging. Space exploration is not easy or predictable," said NASA Administrator Daniel S. Goldin. "We will work through this schedule issue, and we undoubtedly will face additional problems in the future. But we are well on our way to the realization of this world-class facility," he said.

The on-orbit assembly of the station originally was scheduled to begin in November 1997 with the launch of the NASA-financed/Russian-built and launched Functional Cargo Block, or FGB. Inadequate funding by the Russian government to the Russian Space

Agency and its contractors for building another key station element—the Service Module—has put construction up to eight months behind.

NASA managers and engineers have been reviewing options to mitigate the impact to the program of the current schedule slip of the Service Module, and to begin the steps necessary to mitigate the impact of potential additional Russian delays. RSA has been a joint participant in the effort to identify these steps. Options under consideration are:

- Modify the FGB to allow for on-orbit refueling and upgrade of its avionics capability. These changes will give the FGB the capability to augment the early control and reboost capabilities to protect for a Service Module delay.

- Develop an Interim Control Module in conjunction with the Naval Research Laboratory to provide reboost capability and attitude control in the event that the SM experiences further delays, or propellant storage/reboost capability if the SM

is launched on time. Consider the installation of life support systems in the U.S. lab to allow early human presence on the ISS.

- Define options involving the ICM to provide the functions of a permanent propulsion module in order to complement Russian logistics capability and to provide roll control to replace or complement the Russian Science Power Platform functions.

NASA will determine the timing for decisions which need to be made in the event that Russia is unable to provide its agreed contributions to the ISS program. These decision points will be selected to allow for the timely provision of an alternative capability.

NASA has begun initial steps at the working level to accommodate changes to the space shuttle manifest. Additional adjustments to the remainder of the assembly sequence will be worked in consultation with the other International Partners and research community over the next several weeks.

Total health presents sports injury speaker

The Total Health Program will host a Sports Injuries presentation from 11:30 a.m.-12:30 p.m. Wednesday, May 7, in Bldg. 4 South Rm. 6600.

Dr. Marty Ivey, professor of Orthopedic Surgery and chief of the Division of Sports Medicine at the University of Texas Medical Branch in Galveston, is the featured speaker. Ivey is past president of the Texas Society of Sports Medicine and is a member of the American

Orthopedic Society of Sports Medicine. He has been active in the care of Olympic athletes and served as team physician for the Pan American games in Cuba in 1991.

Employees are invited to listen to this distinguished scholar and physician who is recognized as an expert in the care and prevention of athletic injuries.

For additional information contact Greta Ayers at x30302.



total health

Internet News: Celebrate Earth Day by surfing Web

Many historians trace the birth of the modern ecology movement to the early Apollo program, when images of the Earth taken by astronauts orbiting the Moon provided the first true picture of how small and fragile "spaceship Earth" is from a cosmological perspective.

With JSC celebrating Earth Day this week, it's appropriate to highlight the continued expansion of NASA's database of Earth observations photography.

"Earth from Space: An Astronaut's Views of the Home Planet," is a sample of the "Best 500" astronaut photographs of the Earth taken from the NASA Space Shuttle Earth

Observations Photography database of more than 250,000 images, which is a national treasure.

The Best 500, which can be found at <http://earth.jsc.nasa.gov>, was compiled by the Space and Life Sciences Directorate's Earth Science Branch, led by Kamlesh Lulla, with assistance from Flight Crew Operations Directorate's Astronaut Office, and the Information Systems Directorate's Imagery and Publications and Information Technology Offices. The site's webmaster and author of the versatile interactive index, is Brett Staib.

The images, which were taken

by astronauts and highlight interesting human and geological features and processes, are accompanied by captions that provide detailed information about surface features and why they are of interest to scientists studying the ecosystem. They are divided into categories of cities, Earth landscapes, Earth-human interactions, distinctive features, hurricanes and weather, Earth's water habitats and geographic regions. A technical search page also provides a search criteria entry form where Internet visitors may narrow their search research through six different "and/or" criteria.

Community News

Cooperation key to success of new shuttle training facility

Shuttle mission simulator instructors are now working in a new facility that took about a year to design, develop and implement thanks to a team of JSC employees willing to try new ways of doing business.

The Shuttle Mission Training Facility instruction stations, completed in December, were designed using "rapid prototyping" and feature state-of-the-art hardware and software that any instructor familiar with the old system can learn in a short two-hour overview.

"The significant driver in making this project a success was to involve all customers and developers in the development of an initial set of requirements," said Jeff Fox, NASA lead for the Shuttle Mission Simulator Instructor Station Upgrade. "The project was a success because of routine meetings with all customers and developers, each of whom had the opportunity to review all facets of the project and decide on the best course of action to follow on a weekly basis."

Fox said the teamwork enabled the workers to spend less time on formal paperwork and more time building and testing. An environment of trust between civil service, United Space Alliance and Hughes employees was created whereby every decision on a lower level did not have to go through the project lead or a weekly meeting before action could be taken.

The team worked together from inception through project completion. As displays were first generated, users looked at them and provided instant feedback to the software engineers. Many comments were incorporated on the spot. Details that made the system more user-friendly were added as the system

developed and users became more familiar with the new workstation environment. By the time the system was ready to be tested, many of the problems that would have shown up as test failures or as undesirable features had already been corrected.

"We started using a 'build a little, test a little' type of concept very early on in the project. We chose to document how the system really would work instead of trying to perfect the paper requirements a year in advance," Fox said.

When the project was complete, the result was a user-friendly, high-quality product because users were included in every step of implementation. Instructors were prepared to conduct training in the new environment from day one of operations.

The new stations replace 20-year-old technology and provide more flexibility for instructors. The upgrade utilizes state-of-the-art technology based on a UNIX platform that provides a workstation user interface to the simulators. The stations are used to conduct simulations in the motion and fixed base simulators in Bldg. 5 and the guidance and navigation simulator, identical to the fixed based, in Bldg. 35. Instructors input "malfunctions" so astronauts and flight controllers can be ready for any unusual aspects of a mission.

"Management's confidence in the personnel involved allowed the new stations to be used several times for simulation support before the official release date," Fox said. "The teamwork and rapid prototyping approach resulted in an intangible estimate of 130 percent of product delivered for every dollar spent. A good return on our money. It was

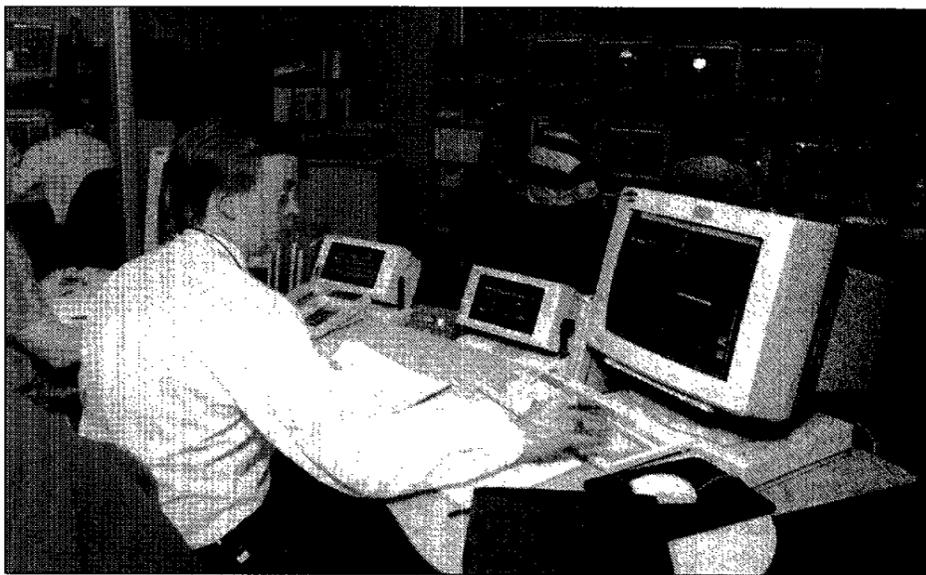


Photo courtesy of United Space Alliance

Shuttle mission simulator instructor Tim Terry is now working in a new facility that took about a year to design, develop and implement thanks to a team of JSC employees willing to try new ways of doing business.

probably due to about 30 percent good process and 70 percent outstanding people."

More than 100 employees contributed to the upgrade making the project a success. Some of the major contributors were:

NASA: Jeff Fox, Frank Hughes and Ray Dell'Osso.

Hughes Training Inc.: Jack Thrift, Richard Gaskin, Jim Loden, Ron Aadsen, Keith Hurley, Mary Matuszko, Darrel Gaines, Jerol Bowie and Alberto Barrera.

USA Project Engineering and Management: John Waters, Mary Ferris, Kathy Rogers, Mike Vaughn and Zack Crow.

USA Hardware Engineering: Robert

Orahood, Bill Ramsey and Craig Wittig.
USA Software Engineering Integration and Testing: Harold Brown, Willie Albores, Petr Polak, Chet Conrad and Thuy Mai.

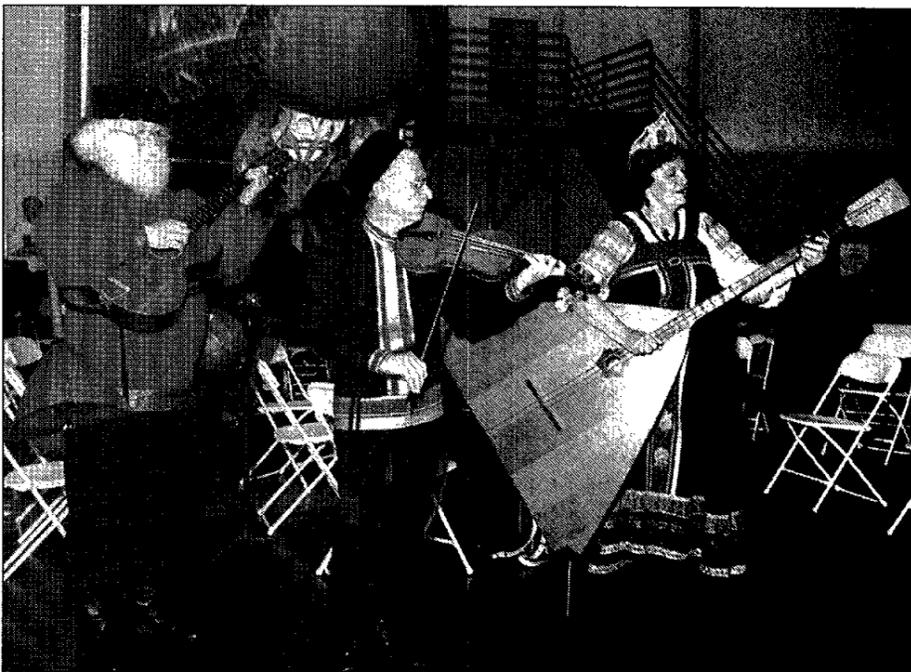
USA/NASA Training: Mike Sterling, Dan Bailey, Walter Barnett, Tandra Gill, Joaquin Andujo, Rodney Harberson, Jon Kennard, Tim Terry, Juan Garriga, Mike Jensen, Melanie Miller and Ginger Deans.

USA Maintenance and Operations: Denis Charpentier, Tom Crofton, Dan Durmas, Carl Edmonson, Richard Eick, Gary Gonzales, David Lyssy, Patricia Portilla, Steve Rowlands, Larry Stachey, Jim Svehla, Scott Turner, Joe Knight, Cynthia Jackson and Joe Vlaming.



JSC Photos S97-04915, S97-04912 by Steve Candler

RUSSIAN FESTIVAL—Dignitaries kick off the second annual Russian Festival April 11 at Space Center Houston. Top: Texas Sen. J. E. "Buster" Brown, R-Lake Jackson, center, presents the Texas Congressional proclamation naming April 12 as Space Explorers Day to Phase 1 Program Office Manager Frank Culbertson, left, and Russian Cosmonaut Vladimir Titov, right. Culbertson and Titov were honorary co-chairs of the festival. Right: the Russian Folk band, Caravan, performs at Space Center Houston.



New exhibit opening at SCH

Space Center Houston is hosting the world premiere of Robot Zoo, the highlight of the center's summer attraction.

The exhibit, scheduled to be unveiled May 24, mechanizes ordinary animals into extraordinary robot creatures, revealing nature's magic as master-planned machinery. Through entertaining, educational and interactive 3-D adventure stations, SCH guests can look at the marvel of nature through the genius of engineering.

Larger-than-life animated robots include a 9-foot-long chameleon, a 9-foot-long rhinoceros, a 6-foot giant squid with 18-foot tentacles and a 9-foot-long platypus. Also featured are a 6-foot-long house fly with a 10-foot wingspan, a 9-foot-long grasshopper, a 6-foot bat and a giraffe whose head and neck alone stretch 9 feet tall.

Interactive displays, in the 5,000 square foot exhibit, offer hands-on exploration of scientific concepts. Computer displays allow visitors to try out cutting-edge technology developed for scientific applications such as aerospace and automotive design, oil and gas exploration and

weather forecasting.

Some of the interactive highlights include:

Sticky Feet—Using hand and knee pads, guests can try to stick like flies to a sloping surface;

Mister Platypus—Children can build a platypus or their own creature by adding different animal parts to the model of a platypus' body;

Squid Propulsion Simulation—Would-be engineers use computational fluid dynamics to manipulate nerves and muscles that control the flow of water a squid expels to jet away;

Tongue Gun—A shooting gallery from the animal kingdom where a chameleon takes aim at spinning dragonfly targets;

Keep an Eye on You—The robot model of a chameleon's head shows how the reptile views the world; and

Hide and Seek—Small children can explore the concept of camouflage by selecting a patterned coat and standing in front of a patterned wall and watch themselves appear and disappear on a video monitor.

For more information call SCH at 244-2105.

JSC Safety Alert

Potential Electrical Shock Hazard Involving Exterior Street and Parking Lot Light Poles

What happened

Several exterior street and parking lot light poles at JSC were found to have defective electrical grounds that could result in electric shock hazard if the pole is touched.

Outcome of the Investigation

Randomly sampled exterior street and parking lot light poles were tested and found to have defective grounds. This is primarily a result of the following components:

- The design of the power distribution circuit, which lacks an equipment grounding conductor. This original installation met the National Electric Code at the time of installation.
- The breakdown in the connections to the supplemental ground rod. Under certain fault conditions, the Earth will act as the sole equipment grounding conductor.
- The unlikely combination of a defective grounding condition and a fault can lead to potentially lethal electrical shocks if certain conditions occur that allow the pole to become energized. These poles are energized primarily at night but can be remotely energized for testing and repair during daylight hours.

What You Can Do

All personnel should understand the full potential intended by this message: Do not touch street or parking lot light poles.

What is Being Done

Interim measures are being implemented immediately. New ground rods are being installed on each light pole on-site (approximately 900). A temporary means of insulating the base of each pole is being examined. A preliminary report to make recommendations for permanent repair or replacement of the existing exterior lighting system for JSC has been initiated.

Fruitful Alliance

JSC, minority universities harvesting research, technology for exploration

By Jovan-Justine Love

One of the greatest "untold stories" at JSC may be that of the Minority University Research and Education Program. For the past 30 years the program has been nurturing partnerships that are now bearing fruit that may be harvested for use in exploring the solar system.

The research being performed by historically black colleges and universities, Hispanic-serving institutions, tribal colleges and universities with a significant enrollment of students with disabilities could be useful in developing food sources that future space explorers may grow on planetary outposts, state-of-the-art instruments and understanding the effects of microgravity on the human body.

"Minority university faculty and student investigators are highly motivated and deeply excited to work with us in the exploration and development of space," said Dr. Kumar Krishen, JSC's chief technologist for technology transfer and commercialization. "This is an opportunity they want to explore fully. These institutions should be in the history books for the unique contributions they plan to make to lunar base and Mars missions."

Dr. Joseph Atkinson, director of the Minority University Research and Education Program, said an integral part of the JSC research effort is to build partnerships between the universities, industry and government. The MUREP program, which has existed since Congress introduced its institutional aid program for minority universities in 1965, is designed to increase the participation of minority colleges in federally sponsored space aeronautics and related technology programs.

"Over the years, the underpinning of this program has been an increase of the involvement by JSC managers and the enthusiastic interest of minority universities to participate in the NASA mission," Atkinson said.

Krishen, who has provided technical direction to the minority university program from its inception, predicted that scientifically significant results will be reported from minority universities within the next decade.

"The minority university research and technology efforts have made significant contributions including techniques for recycling resources for prolonged stays in space or on planetary surfaces, modeling of gravity and radiation effects on humans, understanding the effects of space radiation on spacecraft and monitoring of environment within the habitable areas," Krishen explained.

MUREP administers and oversees many programs that provide historically black universities with funding for undergraduate, graduate, doctoral and post doctoral student research and education. The Women in Science and Engineering program of Spelman College and the Ronald McNair

Scholars of Morehouse College are examples of the kind of programs supported through MUREP.

In addition, MUREP supported 19 principal investigators who conducted individual research at 15 minority universities. For instance, MUREP helps local minority universities such as Texas Southern University with Dr. Sunday Fadula's Microgravity and Sickle Cell Anemia research. Sickle cell anemia is a genetic disease found in the red blood cells. It mainly affects the black population of this country. Fadula has designed a new drug that promises to prevent the sickling process from occurring. The university's research is centered around testing the new drug for future use.

High-energy cells and batteries is another research project supported by the MUREP program at JSC. This research has the potential to be of significant benefit to an entire range of JSC applications with the development of engineering solutions to various fabrication problems. This research also is being conducted at Texas Southern University.

NASA has established research centers around the country designed to foster new aerospace science and technology concepts and to expand the nation's base for aerospace research and development.

Of the 14 NASA Research Centers of Excellence at Minority Institutions, JSC manages three. They are the Center for Applied Radiation and Research at Prairie View A&M University, the Tuskegee University NASA Center for Food and Environmental Systems for Human Exploration of Space and the Morehouse Medical School center called the Space Medicine and Life Sciences Research Center.

Atkinson said MUREP works to further NASA's commitment to America's minority higher education community and fosters diversity in the NASA-sponsored research community.

NASA Administrator Daniel Goldin said in an introductory brochure about the program that it provides inspiration, hope and opportunity to all Americans.

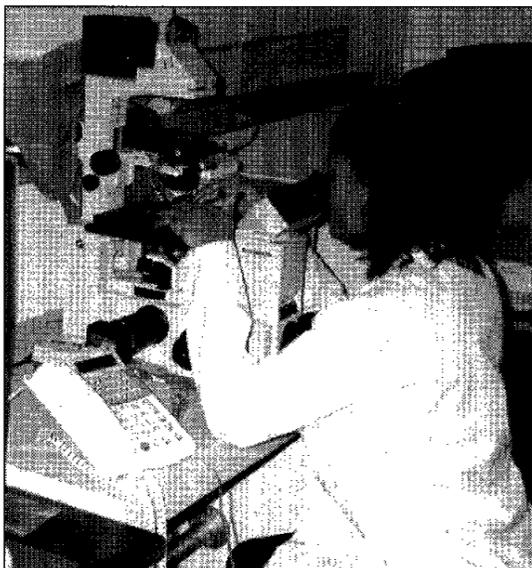
"A world-class space agency must be able to use the lure of discovery to promote peaceful partnerships," Goldin said. "Partnerships between nations, partnerships between government and academia, partnerships with minority universities and small disadvantaged businesses, between students, teachers and entrepreneurs."



Tuskegee University engineering senior Ervin Smith harvests sweet potatoes from an enclosed expandable boundary system which he helped design. Researchers at Tuskegee University are currently developing food sources that future space explorers may grow on planetary outposts.

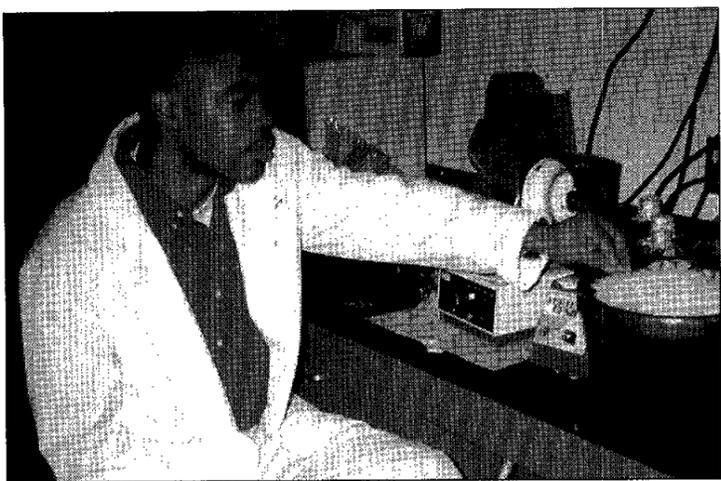


Prairie View A&M University students Billy Jackson, front, and Erick Jackson load a diffusion furnace in the university's Center for Applied Radiation Research Facility. The center focuses on four components—research, human resource development, service, and commercialization and technology transfer.



Caroline Melnado examines cultured cells under a phase contrast microscope for image analysis at Morehouse College's Space Medicine and Life Sciences Research Center. Morehouse College is developing an infrastructure for space medicine and life science research that will help NASA understand the effects of microgravity on the human body.

Photos courtesy
Tuskegee University, Morehouse
College, Prairie View A&M
University



Chris Jones sets up bioreactors for simulated microgravity studies. Three research groups will obtain data that can be integrated and will provide a more precise understanding of the physiological responses to microgravity.

Morehouse assessing biomedical research changes in spaceflight

Morehouse School of Medicine is developing an infrastructure for space medicine and life science research that will help NASA understand the effects of microgravity on the human body.

"The Space Medicine and Life Sciences Research Center, or SMLSRC, is helping develop ground-based research to assess the mechanisms underlying the cardiovascular, musculoskeletal and neuronal effects of microgravity," said Dr. Gary Sanford, a cell biology investigator at the SMLSRC. "The three research groups will use one or more of the research models to obtain data that can be integrated and will provide a more precise understanding of the physiological responses to microgravity."

The three research groups are using altered gravity models, both animal and human, to obtain data. The cardiovascular group uses the head-down tilt bedrest human model and the hind-limb suspended rat model; the cell culture group uses both hypergravity (centrifugation) and the low-shear horizontally rotating bioreactor for cellular studies; the musculoskeletal group

uses the hind-limb suspended rat model. "As the SMLSRC develops and faculty research expertise becomes established, it is anticipated that increased collaborative relationships and non-NASA support will occur," Sanford said.

Both Morehouse and NASA will benefit from the development of multifaceted research that gives students hands-on experience in space medicine and life science research.

"The Morehouse investigations will provide new perspectives on the mechanisms of space flight-induced physiological changes," said Dr. Clarence Sams, a member of the NASA Technical Review Committee that oversees the Morehouse research. "This information will improve the assessment of crew member health risks and will aid the development of appropriate countermeasures to the adverse effects of space flight."

Morehouse Project Director Dr. Myrtle Thierry-Palmer works closely with students to obtain valuable research that will establish guidelines for future space travelers.

Prairie View radiation research benefits solar system exploration

The Center for Applied Radiation Research at Prairie View A&M has developed new state-of-the-art instrumental methods that are providing cheaper and safer ways to evaluate the response to space radiation of electronic, photonic and bio systems.

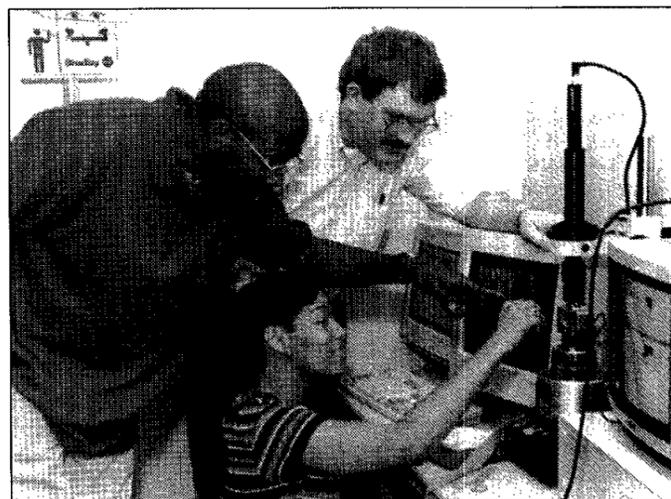
The center focuses on four components—research, human resource development, service, and commercialization and technology transfer. It examines three technical areas, space environment simulation, radiation effects on electronic and photonic systems and biosystems. While the center covers a wide range of topics for research, it concentrates on radiation effects.

"We have continued to improve our measurement capabilities which will allow a better understanding of defects at the interface between silicon and silicon dioxide," said Dr. Richard Wilkins, senior research scientist at the center. "The quality and integrity of this interface governs the performance of most advanced integrated circuits including those used in space applications."

Wilkins said the center recently has embarked on projects in new materials and quantum devices that have the potential for revolutionizing space technology. Students are studying the electrical characterization of wide band semiconductor ilmenite, a common mineral found on the Moon.

"The minority university research and technology efforts have made significant contributions including techniques for recycling resources for prolonged stays in space or on planetary surfaces, modeling of gravity and radiation effects on humans, understanding the effects of space radiation on spacecraft and monitoring of environment within the habitable areas," said Dr. Kumar Krishen, JSC's chief technologist for technology transfer and commercialization.

Krishen chairs the NASA Technical Review Committee that oversees the Prairie View Research. He works closely with Director Thomas Fogarty to obtain valuable research on the effects of radiation on space travelers.



Kirk Powell, left, explains to Elonda Ledet how to load a sample into the scanning probe microscope with the help of Dr. Richard Wilkins, senior research scientist at Tuskegee University. Students are studying wide band semiconductor ilmenite, a common mineral found on the Moon.

Tuskegee research focuses on planetary outpost food growth, recycle

Researchers at Tuskegee University are currently developing food sources that future space explorers may grow on planetary outposts.

Tuskegee's Center for Food and Environmental Systems for Human Exploration of Space, or CFESH, is conducting research on sweet potatoes and peanuts in order to gather information on production, processing, usage and recycling.

Dr. Walter Hill, director of CFESH, said the university is evaluating the crops for compactness of growth, high yield, dry matter content, early maturity and good nutritive qualities and taste.

"These two crops can be processed into a variety of foods using foliage, roots and nuts," he said.

The work of CFESH is organized under four teams, Hill said. The Germplasm Development and Improvement team evaluates the crops for growth in controlled environments. The team is using both conventional breeding and molecular genetics techniques to produce plant material with desirable traits for an advanced life support system.

The Crop Production and Environmental Systems team focuses on gathering baseline data on growth and yield under a variety of conditions.

"In the near future, this team will experiment with solid substrates such as lunar simulants and zeolites that are being used at JSC," Hill said.

The third team, Waste Management and Recycling, is developing ways to recycle the crop in a partially closed-loop system, while the fourth team, the Food Technology and Utilization team, evaluates the nutritional value of the crops. The team also is developing food processing techniques and storage criteria and is developing menu items that enhance nutrition and taste good for future space explorers.

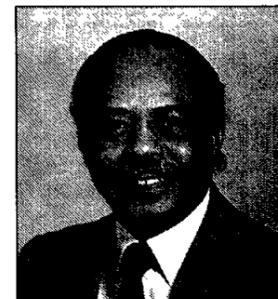
"The two crops at Tuskegee may be among the crops that we will grow in the new Bio-Plex," said Dr. Doug Ming, space scientist involved with space plant growth in Engineering's Crew and Thermal Systems

is expected to be operational at the beginning of the next century.

"Tuskegee will work closely with the developers of the Bio-Plex facility at JSC," Hill said. "This type of testing will provide the necessary

'Over the years, the underpinning of this program has been an increase of the involvement by JSC managers and the enthusiastic interest of minority universities to participate in the NASA mission.'

—Dr. Joseph Atkinson
Director, Minority University Research and Education Program

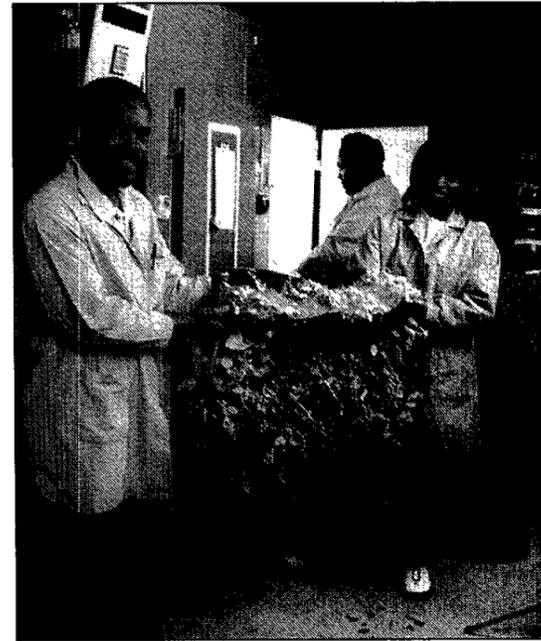


Division. "Bio-Plex will test life support systems for a planetary outpost."

Bio-Plex, the acronym for Bioregenerative Planetary Life Support System Test Complex, is currently under construction in Bldg. 29 and

data for a similar facility to be used on the Moon and or Mars in the coming century."

Dan Barta is a member of the NASA Technical Review Committee that oversees the work at Tuskegee University.



From left: 1) High school interns Tarmen Siaway and Darren Kindell cut apart the foliage so measurement can be taken of leaves and petioles of each sweet potato plant during harvest time. 2) Ivy Bradford, a chemistry graduate student, and Kendra Staniel, an environmental sciences graduate student,

examine the storage and other root components of sweet potato plants. 3) Dr. Desmond Mortley, Crop Production and Environmental Systems team lead, and graduate student Kendra Staniel examine a channel of peanuts taken from a growth chamber for harvest and data collection.

27 Years Ago at MSC



JSC Photos S70-35144 and S70-35607

Above: From left, Flight Directors Griffin, Kranz and Lunney celebrate after the Apollo 13 splashdown. Right: From left, Apollo 13 Lunar Module Pilot Fred Haise, Commander Jim Lovell and Command Module Pilot John Swigert board the USS Iwo Jima following splashdown and recovery operations in the South Pacific.



MSC rolls out red carpet for Apollo 13 crew

Reprinted from the Space News Roundup April 24, 1970.

The red carpet they rolled out over in Bldg. 4 is one way the Apollo 13 crew was welcomed back to MSC. The crowds at Ellington were another way; and the eyes on TV sets all over the center at 12:07:44 CST on Friday, April 17 were yet another.

Quite a celebration welcomed the three astronauts when they returned to their offices at MSC: their offices were decorated with party trimmings, the red carpet had been brought out, telegrams and good

wishes papered the walls. One telegram, from the people of Halifax Nova Scotia, ran 10 feet long.

Now the task of analyzing the mission itself has begun. A blue ribbon Apollo 13 Review Board was announced Tuesday to investigate the causes of the inflight failure of the service module cryogenic oxygen system which forced the Apollo 13 deep-space abort.

NASA Langley Research Center Director Edgar M. Cortright was named to chair the review board by NASA Administrator Thomas O. Paine. No estimate has been made of when the board will complete its

investigations.

Commenting on the outlook for Apollo 14 and subsequent missions in the lunar landing program, Paine said, "I cannot yet set a firm schedule for the Apollo 14 mission, as soon as the Apollo 13 review board has completed its review of the accident and we know that we are ready to apply the lessons of Apollo 13 to the next mission, fix the equipment, and understand the procedure, we will announce the launch date for Apollo 14.

The inflight incident took place at about 55 hours after liftoff during translunar coast. One of the two cryogenic oxygen tanks in the ser-

vice module, which supply oxygen to the fuel cells and breathing oxygen to the crew, apparently ruptured following a sudden pressure spike. The other oxygen tank also lost pressure. Photos taken by the crew after the service module was jettisoned about four and one half hours before entry showed the external panel covering the fuel cell and cryogenic tank sector of the service module was completely blown off by the mishap.

The Apollo 13 review board will attempt to pinpoint the probable cause of the accident and recommend any changes in design or procedures for subsequent missions.

Gilruth Center News

New Hours: The Gilruth Center will now remain open until 2 p.m. Saturday and close at 9 p.m. Friday.

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a yellow EAA badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

Intercenter Run: Continues through April 30. T-shirts provided at a cost of \$5. XXL is \$6

EAA badges: Required for use of the Gilruth Center. Employees, spouses eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday; and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

NASA Fitness Challenge: Runs through Aug. 31. Call x30301 for more information.

Complete Weight Control Program: Starts June 24 with sessions on Monday, Wednesday and Friday. For more information call x30301 or x30302.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Pre-registration required. Next class is May 3. Cost is \$25.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required courses for employees wishing to use the weight room will be offered from 8-9:30 p.m. May 8 and 22. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for six weeks.

Aikido: Martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Aerobics: Classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health Related Fitness Program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

Gilruth Home Page: Check out all activities at the Gilruth online at: <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

Time running out on Intercenter Run

NASA civil servants and contractors throughout the agency have just a few days left to turn in their times for the biannual Intercenter Run.

All 11 NASA centers and Headquarters are competing against each other in 10K and two-mile runs. Scoring is calculated using the order in which a runner finishes and the percentage of population at each center.

At JSC, runners time themselves for a two-mile run, 10,000 meter run or both. Each individual then reports to the Gilruth Center to enter his or her times. As times

improve, the scoring sheet is updated for each runner.

Commemorative Intercenter Run T-shirt will be available for \$5-6 each to participants. Only badged employees are allowed to participate.

The competition, which began April 1, ends Wednesday, April 30. At the end of the month, the scoring sheets will be submitted. Results will be available a few months after that.

For more information, contact the Gilruth Center at x33345.

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Houston Astros Baseball: Field box seats \$18. Astros vs. Florida Marlins 7 p.m. May 3. Purchase tickets by April 25. Astros vs. Chicago Cubs 7 p.m. June 21. Purchase tickets by June 13. Astros vs. Cleveland Indians 7 p.m. July 2. Purchase tickets by June 23.

Galveston Historic Home Tour: 10 a.m.-6 p.m. May 3 and 10 and noon-6 p.m. May 4 and 11. Tickets are \$13.75.

College football: Rice Owls vs. U.S. Air Force Academy Sept. 6. Tickets are \$7.

Bay Area Chorus: Spring Scholarship Concert at 4 p.m. April 27 at Clear Lake United Methodist Church. Tickets are \$10 for adults, \$5 for students and seniors.

EAA cruises: Seven-day cruise to Alaska for \$1,294 per person May 23-31. Seven-day cruise to Caribbean leaving from Houston in November. Prices vary depending on cabin choices. For more information call Dick McMinimy at x34037.

Astroworld: Early bird tickets are \$18.25 and must be used by May 31.

Moody Gardens: Tickets are \$9.50 for 2 of 3 events.

Space Center Houston: Adult \$8.95; children (4-11) \$6.40.

Seaworld: Adult \$27.25; \$18.25 children (3-11).

Schlitterbahn: Tickets are \$20.25 for adults, \$17.50 for children.

Splashtown: Early bird tickets are \$11.50.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.

JSC logo shirts: Polo style, \$23. T-shirt, \$10.

Stamps: Book of 20, \$6.40.

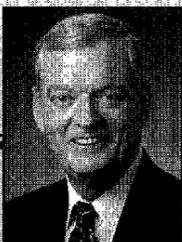
Orbit: The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for \$28.

Metro tickets: Passes, books and single tickets available.

Manager's Message

By Glynn Lunney

Vice President and Program Manager, United Space Alliance



Lunney

The International Space Station program represents a tremendous challenge to the ingenuity and capabilities of the entire NASA/contractor team including all of our international partners. The scale and technical complexity of the assembly far exceeds any previous orbital operation in space history.

Today, in the spring of 1997, the Phase I portion of the ISS program continues to develop the experience, cooperation and hardware foundations for the upcoming assembly of the ISS. We are now flying the fifth of a planned series of up to nine missions to the Mir Space Station. NASA flight crews—Thagard, Lucid, Blaha, Linenger—will soon be followed by other crew members who will live and work aboard the Mir. These Mir missions will continue to provide extensive experience and understanding while being conducted in a space vehicle which is now more than 11 years old. Past and new problems will be overcome as the crews maintain Mir and perform many on-board experiments.

Although this seems new to us, this process is very analogous to the program sequence which made Apollo the success it was. In between the relatively simple Mercury missions (four manned orbital flights) and the Apollo series, NASA conducted the Gemini program featuring 10 manned orbital missions. Gemini was the precursor to Apollo and provided the experience base and the confidence so necessary for Apollo. During Gemini, the mission planning team joined with the flight crews and the flight control teams to master many flight disciplines, untried-as-yet but mandatory for Apollo. These new challenges

included multi-person crews and the first use of a digital computer and crew interface to guide the spacecraft during ascent, rendezvous, deorbit and re-entry. Many variations of rendezvous were invented and tested. We learned the lessons of EVA—how to train for, how to equip the spacecraft with positioning assists for the crew, how to control the crew workload and when to back out of untenable situations.

Gemini also docked with the Agena stage and used the Agena propulsion to boost the docked spacecraft to a higher altitude. One Gemini mission tested crew endurance in a small compartment on a two-week mission. These flights were successfully conducted while the relative newness of the manned space hardware still required significant attention and workarounds to off-nominal vehicle conditions.

The contribution of Gemini is perhaps best measured by the fact that NASA went from four simple orbital flights in Mercury to Apollo where the second manned mission orbited the Moon and the fifth manned mission, Apollo 11, landed on the Moon. Gemini was the experience and confidence base which enabled and propelled Apollo to that rapid pace.

In similar fashion, the Phase I experience with the Mir Space Station will be an invaluable foundation for the assembly and operation of the ISS, providing NASA with the fundamental tools needed to build a global space outpost capable of supporting continuous science and research well into the first portion of the 21st century.



JSC Photo S97-04910 by Benny Benavides

During a recent Space Center Houston tour, the Rolls Royce Owners Club made a stop at JSC's Rocket Park in their vintage English touring cars. Astronaut Joe Edwards talked with members about the space program during lunch. The Rolls Royce club has 6,000 members world wide and they consider themselves care takers of the vintage cars and are dedicated to the preservation of Rolls Royce and Bentley models. Twenty-four cars made the trip to Texas that began in Austin for the annual Spring tour. About half of the cars were built before World War II including two Silver Ghosts, one of the original Rolls Royce models.

Astronauts award Snoopys

JSC astronauts presented Silver Snoopy awards to 11 employees during the first quarter of 1997.

The most recent civil service employees to join the ranks of Snoopy owners are John Albright and William Hoffman of Engineering; Jamie Forero of Flight Crew Operations; Randy Galloway and Mark Pestana of the Space Station Program Office; and Duane Pierson of the Space and Life Sciences Directorate.

Contractor employees honored with Snoopys are Yu-Ming Chen and Sheila Whelan of Krug Life Sciences; Alla Djigirei of Techtrans; Arden Larouere of Johnson Controls; and William Schaefer of Barrios.

The Silver Snoopy award, administered through the Space Flight Awareness Program, is the astronauts' personal award for outstanding contributions toward mission success and flight safety. It is presented to less than one percent of the NASA and contractor work force.



People on the Move

Human Resources reports the following personnel changes as of March 16:

New Hires

John Lawrence transfers from Headquarters to the Office of Public Affairs.

Temporaries

Cheryl Iman joins the Safety Reliability and Quality Assurance Office.

Janet O'Dell joins the Space Station Program Office.

Reassignments

Joseph Chang and Martin Demaret move from Space Operations to the Business Management Directorate.

Grace Martinez moves from the Business Management Directorate to the Space Station Program Office.

Naveed Quraishi moves from Engineering to the Space Station Program Office.

Joseph Hamilton moves from Mission Operations to Space and Life Sciences.

Jose Olivarez moves from Engineering to Space and Life Sciences.



JSC Photo S97-04857 by Steve Candler

SECRETARIAL TOP HONORS—From left, JSC Director George Abbey presents Ester McFarland of the Space and Life Sciences Business Management Office with the Marilyn J. Bocking Award for secretarial excellence. McFarland was honored for her exceptional skills because of her work performance, her positive attitude and her grace and diplomacy in dealing with others. She is professional, pleasant, helpful and competent. Her commitment and dedication to working with the Space and Life Science secretaries and coordinating more than 30 employees located in several buildings across JSC earned her JSC's top secretarial award.

Dates & Data

April 26

PSI meets: The Professional Secretaries International will host a recognition banquet at 6 p.m. April 26 at the Red Lion Hotel, in the Galleria. Greg Weido, division director for Robert Half International is the featured speaker. For more information call Elaine Kemp at x30556.

April 30

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. April 30 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. April 30 at United Space Alliance, 600 Gemini. For more information call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon April 30 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

May 1

Warning system test: The site-wide Employee Warning System will undergo its monthly audio test at noon May 1. For more information call Bob Gaffney at x34249.

May 6

Financial seminar: The Texas Gulf Coast Council of the National Management Association will host "Financial Strategies for Successful Retirement," seminar from 6-9 p.m. May 6 and 13. Cost is \$60 per couple for NMA members and \$85 for non members. For details call Richard Hergert at 280-0444.

ASQC meets: The Bay Area Section of the American Society for Quality Control will meet at 6 p.m. May 6 at the Ramada King's Inn on NASA Road 1. Paul Newbold, senior certification systems specialist at Phillips Chemical Company, will discuss "Implementing a Successful Supplier Rating System." Dinner costs \$9 and reservations not required. For more information

call Ray Swindle at 281-335-6948.

May 7

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 7 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 7 at United Space Alliance, 600 Gemini. For more information call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

Total health program: The Total Health Program will present a Sports Injuries Presentation from 11:30 a.m.-12:30 p.m. May 7 in Bldg. 4 South Rm. 6600. Dr. Ivey, professor of Orthopedic Surgery and chief of the Division of Sports Medicine at the University of Texas Medical Branch in Galveston, is the featured speaker. For details contact Greta Ayers at 483-0302.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon May 7 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

May 8

SSQ meets: The Houston Clear Lake Chapter of the Society for Software Quality will meet at 6 p.m. May 8 at the Ramada King's Inn on NASA Road 1. Steve Engle of DHT Corporation will discuss "Security on the Internet." Dinner costs \$10 for members and \$12 for non members. For reservations and more information call Renne Peterson at 281-335-2034.

Sigma Xi meets: The Clear Lake Chapter of the Sigma Xi Society will meet at 6 p.m. May 8 in the Forest Room at University of Houston, Clear Lake. Dr. Douglas Blanchard will discuss the "Anti-magnetic Particle Spectrometer." For more information call Mike Duke at 244-2036.

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. May 8 at Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

May 9

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. May 9 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

May 10

Sailboat rides: The Clear Lake Sailing Club will offer free sailboat rides May 10 at Clear Lake Park. For reservations call Richard Hoover at 996-7716.

May 13

NPMA meets: The National Property Management Association will meet at 5 p.m. May 13 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Social and dinner costs \$14. For more information call Sina Hawsey at x36582.

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. May 13 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

May 14

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. May 14 in the Bldg. 3 cafeteria. For more information call G.D. Valle at x38835.

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. May 14 at the Holiday Inn, NASA Road 1. Dinner costs \$15. For more information call Elaine Kemp at x30556.

May 17

NTA meets: The National Technical Association will meet at 10 a.m. May 17 at Texas Southern University School of Technology, Rm. 316. For more information call Pam Denkins at x35272.

May 21

Scuba club meets: The Lunar-fins will meet at 7:30 p.m. May 21 at the Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For more information call Fred Toole at x33201.

News Briefs

NASA, space command announce cooperative efforts

NASA and the Air Force Space Command have agreed to work together in the hopes of saving both organizations costs and sharing in new technologies to benefit future spaceflight and spacecraft. Teams will study seven areas of potential cooperation.

Solar storm spotted by SOHO spacecraft

A large eruption on the Sun was detected on April 7 by the Solar and Heliospheric Observatory, or SOHO spacecraft. The solar eruption is called a coronal mass ejection.

Low ozone measured over north pole

Unusually low levels of ozone over the Arctic were measured during March by satellite-based monitoring instruments operated by NASA and the National Oceanic and Atmospheric Administration. Centered in a stable, nearly circular region over the North Pole, the average March ozone amounts were 40 percent lower than the average March amounts observed between 1979 and 1982.

Hubble tracks fading gamma-ray burst

NASA's refurbished Hubble Space Telescope has made an important contribution toward solving one of astronomy's greatest enigmas by allowing astronomers to continue watching the fading visible-light counterpart of a gamma-ray burst, one of the most energetic and mysterious events in the universe. The so-called optical counterpart is presumably a cooling fireball from the catastrophic event that triggered the massive burst of invisible gamma rays—the highest-energy radiation in the universe. This event may have unleashed as much energy in a few seconds as the Sun does in 10 billion years.

Plant growth increases during '80s

Plant growth in Earth's northern regions increased by 10 percent from 1981 to 1991, and by the end of this period annual growth began about eight days earlier, according to new NASA-funded research. These findings imply that vegetation in northern high latitudes, between 45-70 degrees North, is actively responding to previously reported measurements of increasing atmospheric carbon dioxide levels and warmer-than-average surface temperatures.



The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. Deadline for the submission of articles is Friday, three weeks before the desired date of publication.

The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP2. The main Roundup telephone number is x38648, and the fax number is x45165. Electronic mail messages may be directed to khumphri@gp301.jsc.nasa.gov or kscheidt@gp301.jsc.nasa.gov.

Editor Kelly Humphries
Managing Editor Karen Schmidt

Three astronauts round out STS-90 crew

By Eileen Hawley

Rick Searfoss will command a 16-day mission to study the ability of humans to operate in a microgravity environment for an extended period of time. Joining Searfoss on *Columbia's* flight deck will be Pilot Scott Altman and Mission Specialist Kay Hire. STS-90 is scheduled for a March 1998 launch.

They will join Richard Linnehan and Dave Rhys Williams of the Canadian Space Agency, who were named in August 1996 to support

the STS-90 Neurolab mission, and two payload specialists who will be selected closer to flight.

Searfoss, 40, has flown twice on the shuttle, as pilot on STS-58 on *Columbia* in 1993 and most recently as pilot on *Atlantis'* third docking with the Russian Mir Space Station in March 1996. STS-90 will be Searfoss' first flight as a shuttle commander.

Altman and Hire, both 37, are members of the 1995 Astronaut Class, making their first trip to space

after completing more than a year of training to prepare for assignment to shuttle flights and supporting technical assignments within the Astronaut Office.

Four candidates currently are training for selection as prime and backup payload specialist positions on STS-90. Jay Buckley, Alexander Dunlap, Chiaki Mukai and James Pawelczyk were named in April 1996. Two will fly on the mission, with the remaining two serving as backup or alternate payload special-

ists ready to fly on the mission if necessary.

Investigations during the Neurolab mission will focus on the effects of microgravity on the nervous system. Specifically, experiments will study the adaptation of the vestibular system and space adaptation syndrome, the adaptation of the central nervous system and the pathways which control the ability to sense location in the absence of gravity, and the effect of microgravity on a developing nervous system.

American Heritage Week celebration needs volunteers

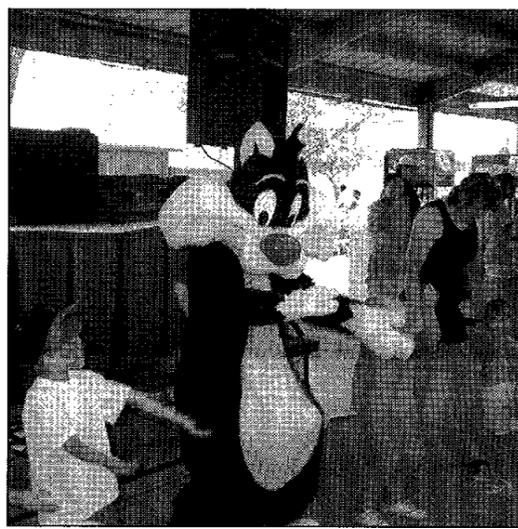
JSC will celebrate its cultural diversity the week of July 7-11 and organizers are looking for volunteers.

"Both civil servant and contractor volunteers are needed to help make American Heritage Week another smashing success," said June Bennett Larsen of JSC's Flight Crew Operations Directorate, and one of this year's coordinators. "You may volunteer as much time as you would like."

Individuals may volunteer for one hour or more. Volunteers are needed to greet and assist entertainers, pick up food and decorations, help decorate, serve food, sit with exhibits and clean up.

"For those who would like to help promote American Heritage Week, dress up in a wonderful costume (of your own design, of course, circa 1776), and tell us that you want to be a Town Crier," Larsen added.

To volunteer, employees may call Larsen at x36080 or the Equal Opportunity Programs Office at x30601. Volunteers should send electronic mail to jlarsen@ems.jsc.nasa.gov



JSC PICNIC—More than 2,500 employees attended the JSC EAA picnic April 6. Top: The Houston Livestock Show and Rodeo speakers provided dance lessons to JSC employees and Bugs Bunny. The speakers provided afternoon entertainment consisting of the Lone Star Cowboy band, a melodrama skit, dancing and singers. Left: Sylvester teaches younger JSC members how to do the Macarena. The annual picnic was held in the A&W Ranch at Astro-world. Employees enjoyed all-you-can eat barbecue, footlong hot-dogs, soft drinks and ice cream. Face painters rounded out afternoon activities.

JSC Photos S97-04903, S97-04905
by Ginger Gibson

Strategic plan meeting outlines JSC's future

(Continued from Page 1)

missions down the road."

McMonagle also discussed space suit hardware modifications being developed to give crews the ability to resize the suit on-orbit. With these modifications, he said, one torso and backpack with interchangeable parts can support several crew members.

The EVA Project Office also is responsible for risk mitigation activities for the space station. This involves verifying that tools for building the station will work with one another and function in the demanding space environment. For instance, 5,600 interface tests were conducted before STS-82, the Hubble servicing mission, McMonagle said.

A new lead center function at JSC is the Space Operations Management Office, headed by O'Neill. "It is an agency-wide responsibility that has been given to JSC as part of the

entire process of moving responsibility for our programs and support of those programs from Headquarters down to the centers," O'Neill said.

SOMO's origin lies in challenges put forth by the White House National Performance Review initiative and the NASA Zero Base Budget Review, completed in the Spring of 1995, he said. An implementation review and recommendations from the Space Operations Streamlining Team culminated in the establishment of SOMO in the fall of 1995.

"Our function consists of planning, acquiring, and deploying those operational services across the agency that are needed for the design, mission preparation, and flight execution phase of all our NASA space flight programs," O'Neill said. SOMO's scope includes the worldwide communications networks: the Tracking and Data Relay Satellite network,

ground networks, and command, control, and data processing facilities across the agency.

Other SOMO goals include reducing duplication and overlap across the agency, placing NASA employee emphasis on R&D and science, transferring operations services functions to the private sector or universities where possible, and reducing operations costs to enable new programs within a limited budget.

Stone, of Mission Operations, talked about meeting the challenges of upgrading the orbiter fleet. MOD has embarked on new projects including several partnerships designed to further operations concepts and development across the agency.

"We have partnered with Engineering and NASA research centers, primarily Ames and JPL, to utilize technology that more effectively allows us to perform space station

planning and execution," he said.

Stone also discussed developing new technologies that would benefit not only the Mission Control Center, the shuttle and station programs, but would be used in the future for Moon and Mars exploration mission. These technologies include onboard and distance training, which would be used in long term space exploration. He emphasized using the MCC as a test bed for operations concepts and operations development, and its flexibility to support other programs.

"When we fly to Mars, many of the things the control center has to do today will have to be done onboard, and it is those kinds of technologies we are trying to pursue to position ourselves for the future," Stone said.

The next Strategic Planning All Hands meeting is scheduled for May. The date and times have not been set.

Computer users now may use E-mail to reach help desk

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the help desk since January 1994.

"Right now we're still in a transition, learning all the different functions of support provided—network problems, servers, workstations, mail issues," she explained. "Right now, we're cross training. Every four weeks, each group goes and sits with another group and gets an overview and detailed training. The plan is that when someone calls with a question we'll be able to answer the question or resolve the problem on the first call. That's the goal."

The second phase of the improvement effort—now in progress—will

tailor training for end users, use remote diagnostics and knowledge-based tools, improve standardization of hardware and software, increase user awareness through Roundup articles and JSC's Intranet homepage, and decrease the administrative overhead associated with providing service.

End users can do a number of things to help further minimize the number of help desk calls, which in turn reduces the wait time for those who do call. To seek status of a problem in work, the user can send an E-mail note to the HELP DESK address in the global address list

(formerly ISOC—Help Desk) rather than placing a call to the Help Desk. Similarly, if assistance with how to use the features of a software package, e.g. Word, Excel, etc., is needed, consultation is available through someone in the user's work group or the ISD Customer Service Agent. Finally, if the user is working with a package that is new or is trying to use a software function they haven't needed before, they may contact the training organization in the Human Resources Office to register for one of their classes.

Plans for the remainder of this fiscal year include bringing the center

up to the hardware and software levels specified in JSC's standards, increasing user support in the office environment through the use of dedicated support and increased participation of Customer Service Agents, installing tools to help automate some of labor-intensive activities, and improved training aimed at helping users become more proficient in the use of information technology tools.

"We have a lot of hard working people here," Branham said. "We care about the user community out here and we try to do our best every call."